

# Abdominal and Lower Extremity Exams

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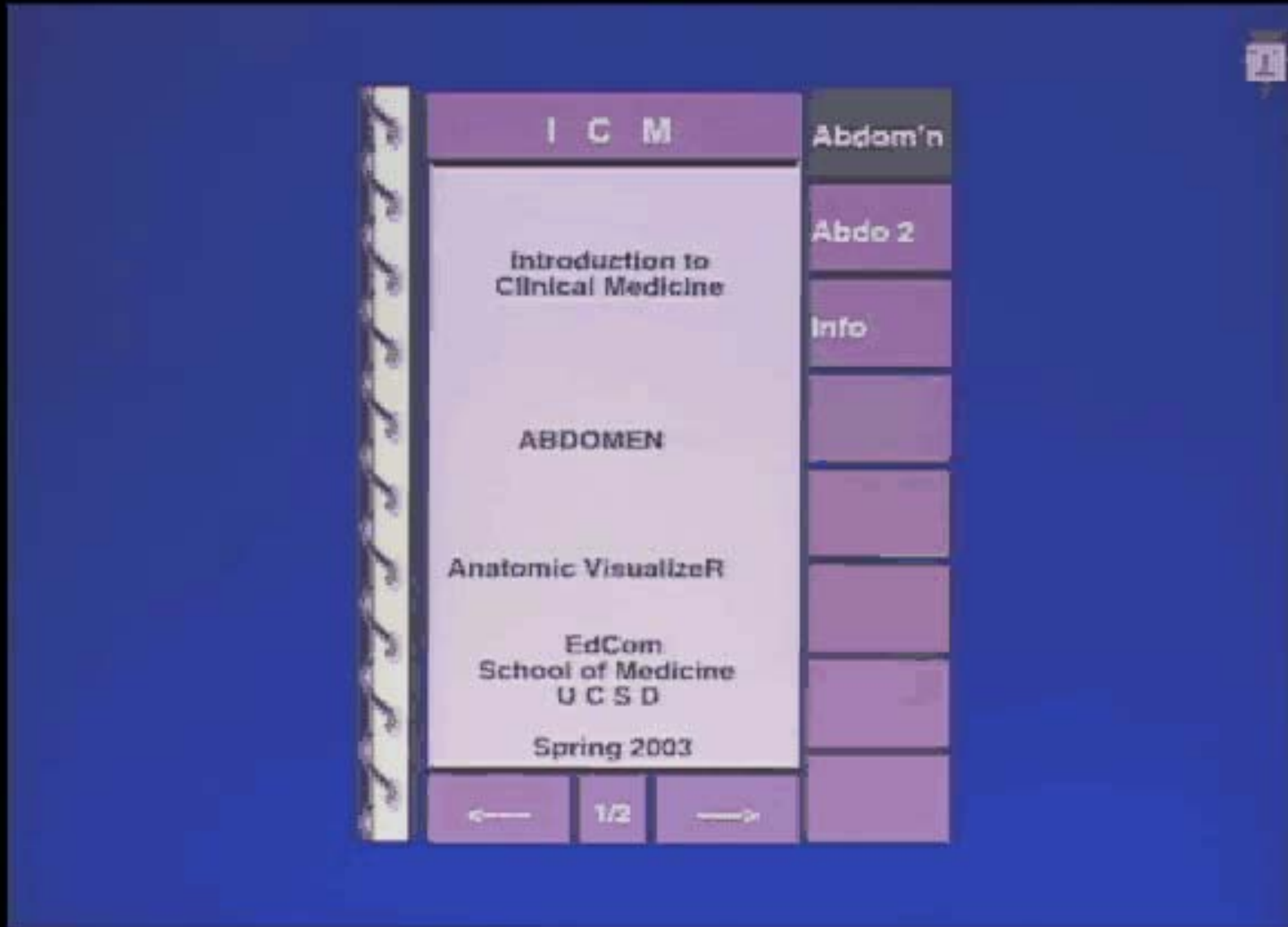
# Abdominal Exam

- 4 Elements: **Observation, Auscultation, Percussion, Palpation**
- **Pelvic, male genital & male/female rectal** exams all **critical** parts of Abdomen exam  
→ covered **next year**

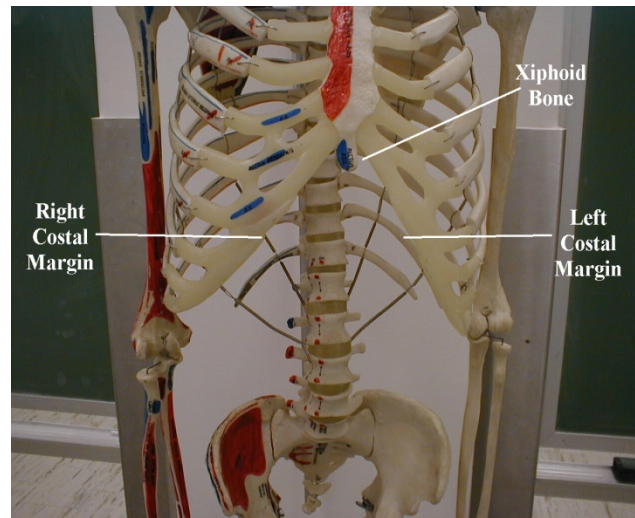
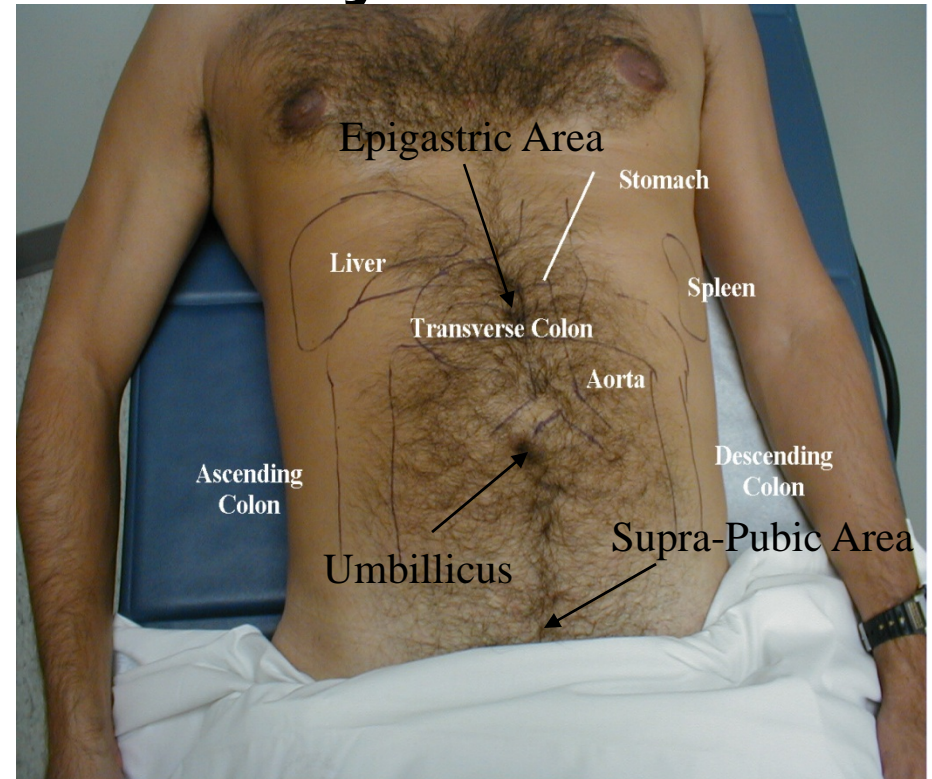
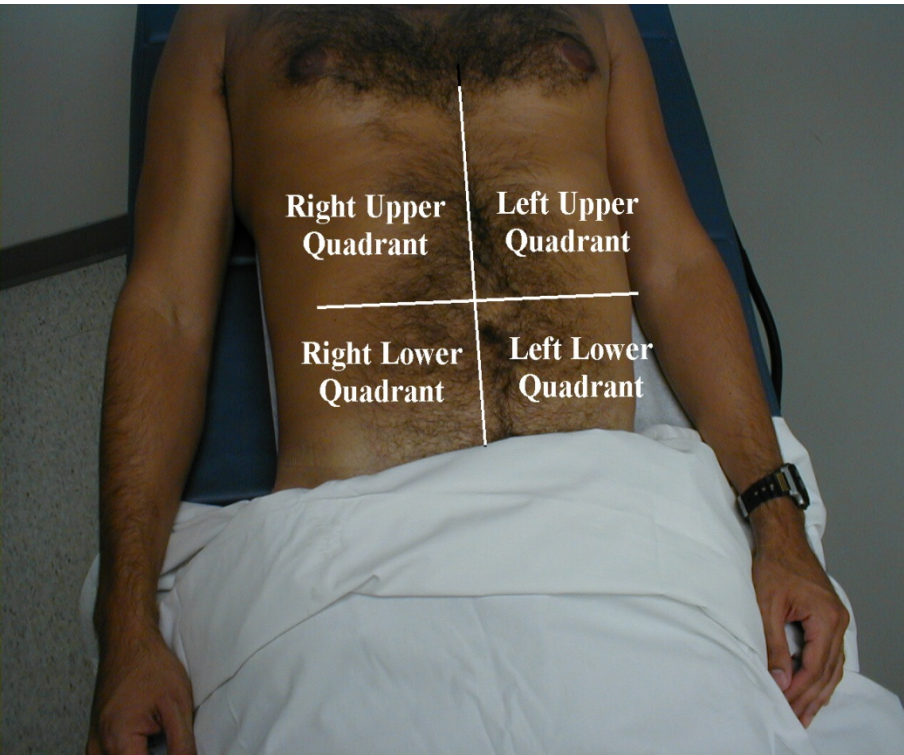


# Anatomy

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# Surface Anatomy



# Observation



- Exposure → **Drape** for **success!**
- Good **lighting**, **warm** room, table flat, **hands** at **side**, head resting on table
- +/- Feet flat on table







# Observation (cont)

- Make note of :
  - general **shape**
  - **contours**
  - **symmetry**
  - **color**
  - **scars**
- ? easiest to make **observations** from **foot of bed**.
- Examine from **R side**



# Examples of Abnormal Findings On Observation



Obese



Ascites (fluid), Yellow



Enlarged gall  
bladder



Umbilical Hernia (R with Valsalva)

# Auscultation



- Normal **intestinal propulsion** of food (peristalsis) generates **noise**
- **Listen** (diaphragm of stethoscope) x 15-20 seconds in **4 quadrants**
- Pay attention to: **presence**, quantity (nl ~ 2-5 seconds), & **quality** of sounds





# Auscultation (cont)

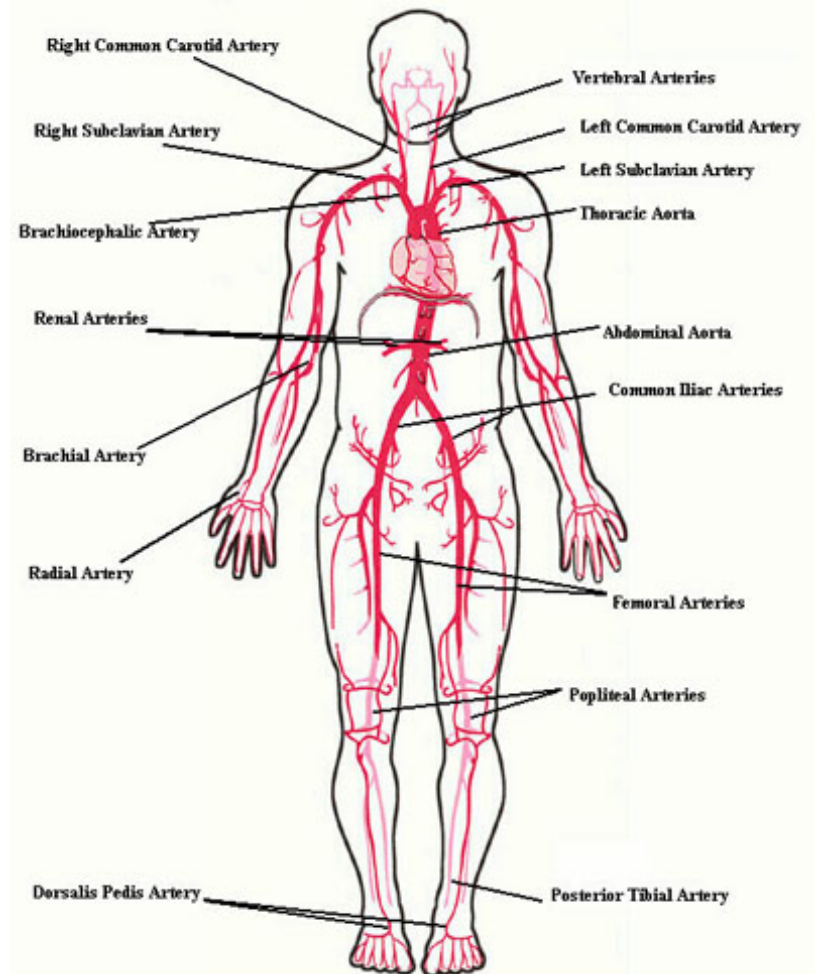
- Clinical **utility**:
  - **Intestinal Obstruction**:  
**Increase** in **frequency** early (“rushes”) → **declines** in quantity, increase pitch (“tinkles”) → **stop**
  - **After** being handled (**surgery**) → **no function** or **noise** (ileus) → w/normal **recovery**, **noise** returns
  - **Infection of mucosa** (gastroenteritis) → **increased** frequency
- **No** findings **pathognomonic**
- **Auscultation not helpful** in otherwise **normal** exam
- **Clinical context** most important





# Auscultation (cont)

- **Bruits** - sounds of **turbulent** arterial flow  
→ **atherosclerosis**
- Listen over:
  - **Renal arteries**  
(several cm above umbilicus, either side rectus)
  - **Iliac arteries** (below umbilicus)





# Percussion

- Same principle as for Lung exam
- **Tapping** over **solid** or **liquid** filled structure → **dull** tone; **air** filled → **tympanitic** (resonant)
- **Percussion** provides sense of **what's beneath** skin & bones – e.g: liver → dull; air filled stomach → tympanitic
- Abdomen not designed to facilitate exam for 1st yr med students!
  - Important **solid structures protected** - liver & spleen by ribs; pancreas & kidneys deep in retro-peritoneum; bladder & uterus in pelvis
  - **Central abdomen** filled w/**intestines**: freely moving → promotes peristalsis, tolerates direct trauma



# Percussion Technique

- Stand on **R side**
- **Middle finger** of non-percussing hand firmly **against abdomen**
- Using **floppy wrist** action, hammer **middle finger** of **other hand** down, aiming for last joint
- Percuss all **4 quadrants**
  - nl =s mix of dull and tympanitic



# Percussion Technique (cont)

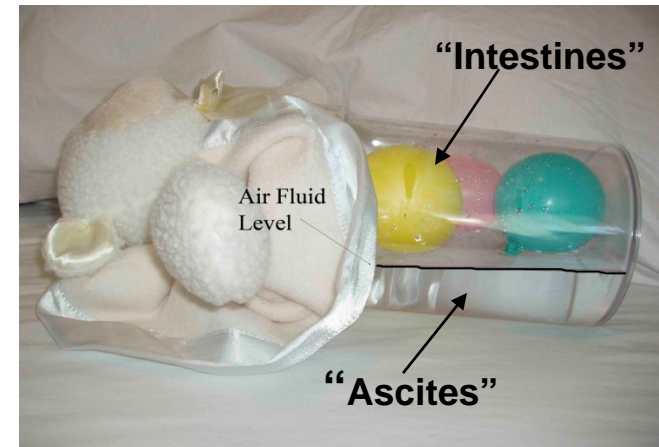
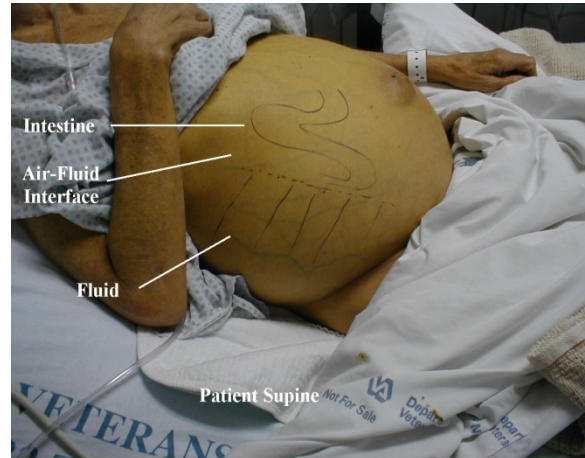


- **Liver span (6-12 cm)** – **Start in chest**, below nipple (mid-clavicular line) & **move down** – tone **changes from resonant** (lung) to **dull** (liver) to **resonant** (intestines)
- **Spleen** – small, located in hollow of ribs – percussion over **last intercostal space**, anterior axillary line should normally be **resonant** – dullness suggests splenomegaly
- **Stomach** – **tympanitic** (epigastric area)



# Percussion – Shifting Dullness

- Detect **large amounts** of pathological **fluid** (ascites)
- **Intestines** will **float** to surface
- Percussion can detect **air-fluid interface**
- **Change** in **position** shifts point of **interface**

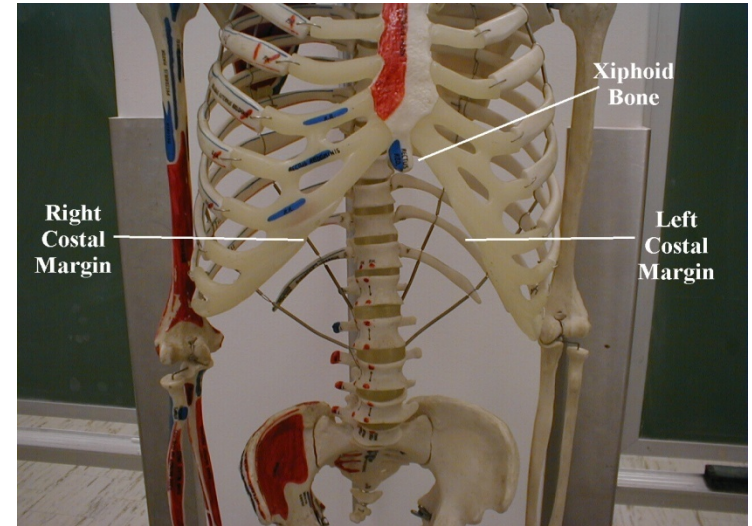




# Palpation



- **Most important structures aren't palpable**
- **Warm your hands**
- Generally **right hand** used (left placed on top or @ your side)
- **Palpate using pads & edges of middle 3 fingers**
- **Gentle pressure**, no sudden movements
- Think about **what "lives"** in **area** you're examining





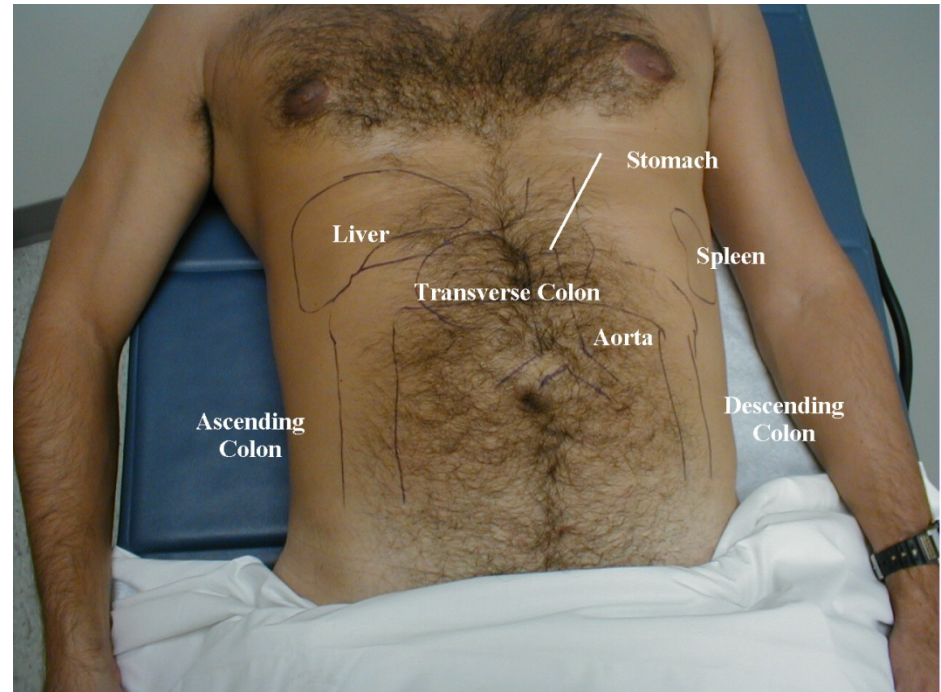
# Palpation Technique

- First explore **superficial** aspect **each quadrant** (start R lower→R upper→L upper→L lower)

- **Deeper** palpation

## Liver

- **Start R lower**, moving up towards R ribs
- **Move** hands a **few cm** up w/each palpation
- **Push down** (posterior) & then **towards head**
- As approach ribs, **palpate while** patient **inspires** deeply (diaphragm brings liver down towards hand)
- Might feel **liver edge** in normals (usually not)





# Palpation Technique (cont)

- Deeper Palpation (cont)

## Spleen

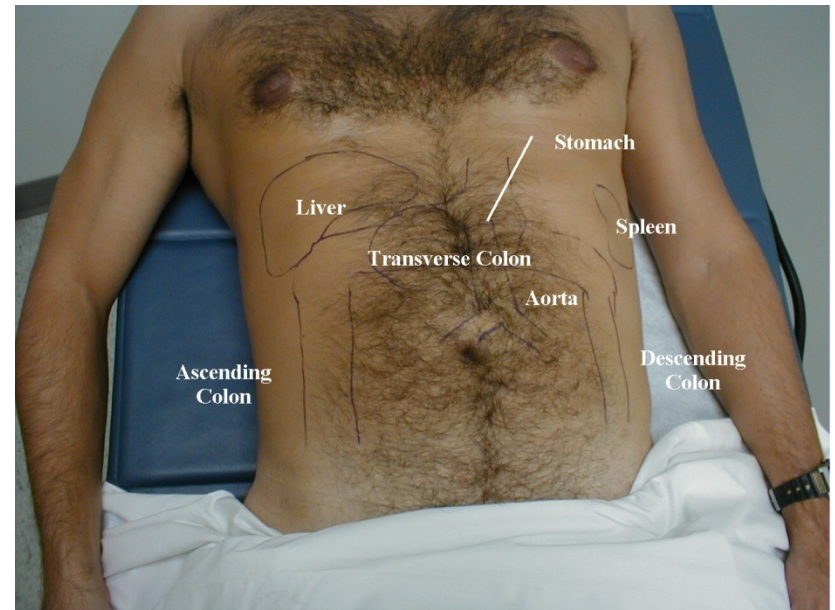
- Palpate towards **L upper quadrant** from midline & below - use L hand to “pull” spleen towards you

## Aorta

- Above umbilicus, L of **midline**
- Push down (deep) w/palpating hand

## Remainder of abdomen

- **Uterus, bladder**, other (rarely palpable)
- Evaluate **painful areas last!**

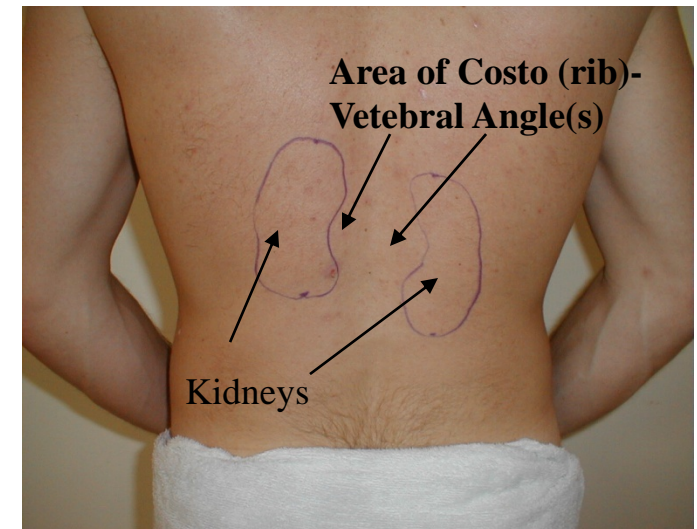
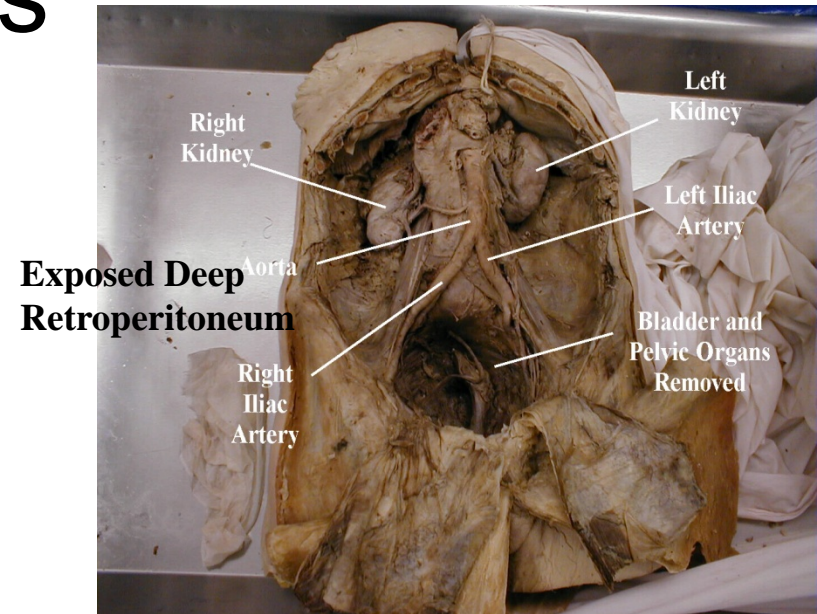




# Palpation/Percussion Of The Kidneys



- **Kidneys** are **retroperitoneal** structures, deep & protected by the ribs → **rarely palpable**
- If markedly enlarged, may appreciate in lateral aspects abdomen (rare)
- Assess for tenderness via posterior approach, **tapping** on **back** at **Costo-Vertebral Angle** – if kidney infected (pyelonephritis), patient will have **Tenderness (CVAT)**





# Put Findings Together→ Paint The Best Picture

Abdominal exam techniques compliment each other!

- **Ascites**

- Observe distention, bulging flanks
- Palpation→ no evidence of mass
- Percussion→ shifting dullness

- **Enlarged liver**

(hepatomegaly)

- Percussion indicates extension of liver below diaphragm
- Palpation confirms location of lower edge (also detects contour, texture)

# Lower Extremity Exam – General Observation, Including Femoral Region



- **Expose** both **legs**, noting:  
asymmetry, muscle atrophy,  
joint (knee, ankle) abnormalities
- Focus on **Femoral** Area:
  - Inspect - ? Obvious  
swelling → femoral **hernia** v  
large lymph **nodes (rare)**
  - **Palpate** lymph nodes

Note: Ok to skip femoral  
observation today in  
anatomy lab!



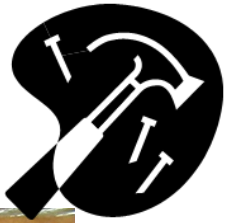
# Femoral Region (cont)

- Identify **femoral pulse**
- **Listen** over femoral artery with **diaphragm** stethoscope for **bruits** (if suggestion **vascular disease** by hx, exam)

[Femoral Artery Anatomy](http://www.nlm.nih.gov/medlineplus)

(<http://www.nlm.nih.gov/medlineplus>)

# Knee



- **Observe** for evidence swelling, discoloration, scars
- **Range of motion** - flexion to full extension → ? pain or limitation
- ? **Warmth** on palpation
- W/knee **sl bent**, push **fingers into popliteal fossa** → assess popliteal artery
- Detailed examination of internal structures knee (ligaments, meniscus, etc) → **next year!**



# Feet and Ankles



- Lower leg & feet @ greatest risk **atherosclerosis** and neuropathy (in U.S.) – particularly if Diabetes
- **Observe**
  - ? **swelling** (edema), **discoloration**, **ulcers**, nail deformities
  - Look @ **bottom of feet**, between toes (problem areas)
  - **Symmetry?**



# Feet and Ankles (cont)



- Palpation
  - **Temperature:** Use back of examining hand - warm→inflammation; cool→atherosclerosis &/or hypo-perfusion
  - **Capillary refill:** push on end of toe or nail bed & release→ color returns in < 2-3 seconds; longer→ atherosclerosis &/or hypo-perfusion





# Feet and Ankles (cont)

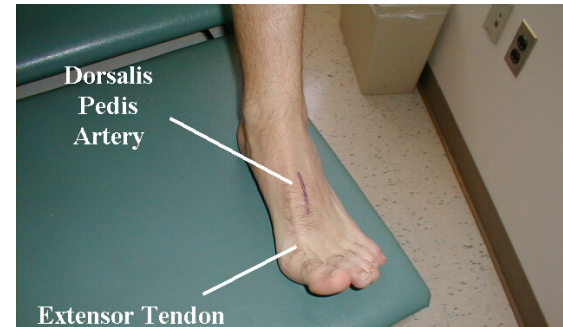
- Palpation (cont)
  - **Edema:** Quantify (subjective) & determine extent (how high)
    - **trace** (minimal), can be subtle loss of tendons on top of foot, contours malleolous
    - **4+ =s “a lot”** - pitting (divot left in skin after pressure applied)



# Dorsalis Pedis Pulse



- Palpate **Dorsalis Pedis** pulse
  - Just **lateral** to **extensor tendon** great toe
  - Use **pads of 2-3 fingers** of examining hand
  - Push gently
  - If unsure whether feeling your pulse v patient's, measure your carotid or their radial w/other hand
  - Graded **0** (not detectable) to **2+** (normal)

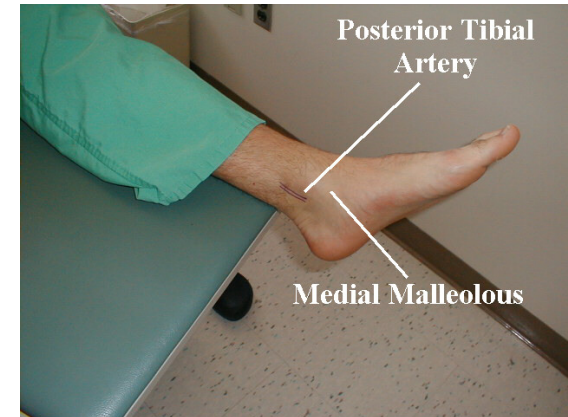




# Posterior Tibial Pulse



- Palpate **Posterior Tibial Pulse**
  - Located **posterior** to **medial malleolous**
  - Start on top of mallelous & work towards achilles
  - Use pads of **2-3 fingers**, pushing gently
  - Same rating scale as for dorsalis pedis



# Summary Of Skills



- ☐ Wash Hands
- ☐ Observe abdomen (shape, contours, scars, color, etc)
- ☐ Auscultate abdomen (bowel sounds, bruits)
- ☐ Percuss abdomen (general; then liver & spleen)
- ☐ Palpate 4 quadrants abdomen (superficial then deep)
- ☐ Assess for kidney area pain (CVAT)
- ☐ General lower extremity observation
- ☐ Assess femoral area (palpation for nodes, pulse); auscult fem art
- ☐ Knees – color, swelling, range of motion; popliteal (behind knee) pulse
- ☐ Assess ankles/feet (color, temperature, pulses, edema, cap refill)

Time Target: < 10 Minutes